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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,819	11/20/2003	Dmitry Potapov	50277-2294	3301

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2163	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/719,819	POTAPOV ET AL.	
	Examiner	Art Unit	
	Helene Rose	2163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32 and 34-37* is/are pending in the application.

4a) Of the above claim(s) *33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32 and 34-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

2. Applicant's submission filed on 2/26/2007 has been entered.

3. Claims 1, 2, 4, 6, 34-36 have been amended. Claim 33 is cancelled. No claims have been added. Therefore, claims 1-37 are pending.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1 and 34 (and its dependencies where applicable) are rejected under 35 U.S.C 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1 and 34 (and their dependent claims, where applicable) recites a computer readable medium performing the method, wherein the claims recites a computer readable medium that includes carrier waves and or/ data signals, which

are not within any of the four statutory categories (see Specification [0076] and [00080].

Therefore, a medium transmitting or carrying instructions is not considered a process, machine, manufacture, nor composition of matter, is considered to be nonstatutory matter.

Claim Rejections – 35 U.S.C – 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graefe (US Patent No. 6,298,342, Date of Patent: October 2, 2001, hereinafter Graefe) in view of Agarwal et al (US Patent No. 7,080,081, Date Filed: April 15, 2002, hereinafter Agarwal).

Claim 1:

Regarding claim 1, Graefe teaches a machine implemented method comprising:

accessing rows in a database table (column 5, lines 61-64, wherein this reads over "the records of the input table are accessed", Graefe), wherein:

each row in the table corresponds to a dimension value combination (Figure 4, all features, wherein the figure is further defined throughout columns 8-9, respectively, Graefe);

a database system defines, for said database table, a dimension column that contains dimension values (Figures 1 and 2, wherein these figures are further defined in columns 4-5 and Figure 4, all features, wherein it illustrates database table, dimension column that contains dimension values, Graefe); and

Graefe does not explicitly specify or simply state "unit of contiguous storage", however, Grafe does teach the functionality of a "contiguous storage" (column 6, lines 12-13, wherein sequencing accesses to the records of stored database tables".

On the other hand, Agarwal does explicitly define and specify, "each row in the table is stored in a unit contiguous storage" (column 2, lines 4-7, wherein this reads over "a data block is created for each dimension of the table, and the blocks store information in a contiguous storage space, Agarwal);

It would have been obvious to one of the ordinary skill in the art at the time of the invention to incorporate Agarwal teachings into Graefe system. A skilled artisan would have been motivated to combine as suggest by Agarwal [column 1, lines 64-65; column 2, lines 6-7; and column 8, lines 51-58] for establishing an

improved method of accessing data more efficiently to improve a system performance.

a location within a **unit contiguous storage** at which each row is stored is determined based on the dimension-value combination to which the row corresponds (column 2, lines 8-11, wherein each block index comprises at least one key that is associated with a list of block identifiers, wherein the dimensions of the tables are associated with or more columns of the table; column 5-6, lines 57-67 and lines1-27, respectively, wherein this also corresponds to "a location within a **unit contiguous storage** at which each row is stored is determined based on the dimension-value combination to which the row corresponds", Agarwal); and

wherein the accessing of the rows also includes, in response to receiving a request **that indicates** a particular dimension-value combination (column 3, lines 11-12, wherein this reads over "the operation accepts an input table and a pivot specification and produces an output table, Graefe):

using the particular dimension-value combination for calculating a value that represents the **unit of contiguous storage** that stores a particular row **that corresponds to that particular dimension-value combination** row (Figure 4, features 420,440, 450, and 460 and column 12, lines 42-57, wherein using PIVOT (SUM (Sales) FOR Quarter IN spring, summer, fall, and winter, wherein this query consolidates sales for East and West regions into a single sum representing the entire company for each year, which is interpreted to be equivalent to "using the

particular dimension-value combination for calculating a value that represents the unit of contiguous storage that stores a particular row that corresponds to that particular dimension-value combination row", Graefe); and

using the value to access the particular row (column 8, lines 51-65, wherein column 9, lines 35-42, wherein applying the unpivot operation 440 to the pivoted table 430 restores tables 410, wherein the two columns sales and quarter replace columns 431-434 and for each row in an input table, the unpivot operation generally produces one row of an output table per pivoted column, Graefe).

Claim 2:

Regarding claim 2, the combination of Graefe in view of Agarwal teaches wherein the dimension value combination includes values for one or more dimensions (Figure 4, diagrams 400, 410, and 430, wherein it illustrates regions East and West corresponds to the sales by quarter or by spring, summer, fall and winter which is interpreted to be equivalent to "dimension value combination includes values for one or more dimensions", Graefe); and

the table does not include columns for storing values for the one or more dimensions (column 8, lines 61-63, wherein a row in the input table does not appear in the output if its value does not appear in the pivot list and column 9, lines 1-2, wherein for output columns not having a corresponding input row, the value is NULL, Graefe).

Claim 3:

Regarding claim 3, the combination of Grafe in view of Agarwal teaches wherein said table includes a plurality of segments, and wherein each segment stores rows for a contiguous range of dimension value combinations (column 6, lines 21-38, respectively, Agarwal).

Claim 4:

Regarding claim 4, the combination of Graefe in view of Agarwal teaches wherein:

the method further comprising creating an indexed organized table that includes an entry for each segment in the plurality of segments (column 5, lines 23-25, wherein DMBS provides services for creating, querying, maintaining and modifying a number of relational database and column 9, lines 18-20, wherein inserts the data item values of the values columns into the rows of the output table, which is interpreted to be "creating an indexed organized table that includes an entry for each segment in the plurality of segments", Graefe); and

the calculating of a value that represents the block that stores of the particular row is based in part on information contained in the entry that corresponds to the segment that contains the particular row (Figure 4, features 420,440, 450, and 460 and column 12, lines 42-57, wherein using PIVOT (SUM (Sales) FOR Quarter IN spring, summer, fall, and winter, wherein this query consolidates sales for East and West regions into a single sum representing the

entire company for each year, which is interpreted to be equivalent to "using the particular dimension-value combination for calculating a value that represents the unit of contiguous storage that stores a particular row that corresponds to that particular dimension-value combination row", Graefe).

Claim 5:

Regarding Claim 5, the combination of Graefe in view of Agarwal teaches wherein sizes of the plurality of segments and locations contained within the plurality of segments are allocated according to a density of discontinuities in ranges of dimension value combinations (column 3, lines 50-64, wherein query such as SELECT year, quarter, sales FROM Narrow WHERE sales&lt (SELECT AVG (sales) FROM Narrow) ORDER BY year, quarter specifies the properties of an output table and the columns of the output table correspond to the columns named year, quarter, and sales taken from an input table named Narrow and the output-table rows (records) are to be ordered (i.e., sorted) by year and then by quarter within each year value and the records from the input table which appear in the output are only those where the value of sales is less than the average value of all values of sales in the table named Narrow; and column 11, lines 30-32, wherein SELECT * FROM Narrow.PIVOT (Sales FOR Quarter IN (Spring, Summer, Fall, Winter), which is interpreted to be equivalent to "wherein sizes of the plurality of segments and locations contained within the plurality of segments are allocated

according to a density of discontinuities in ranges of dimension value combinations", wherein narrow is interpreted to be "density of discontinuities", Graefe)

Claim 6:

Regarding claim 6, the combination of Graefe in view of Agarwal teaches wherein:

the method further comprising accessing an indexed organized table (IOT) that includes an entry for each segment in the plurality of segments (REFER to claim 1, wherein accessing rows in a table and claim 4, wherein indexed organized table that includes an entry for each segment in plurality of segments have already been addressed, Graefe); and the calculating of a value that represents the block that stores the particular row is based in part on information contained in the entry that corresponds to the segment that contains the particular row (REFER to claim 4, wherein this limitation has already been addressed, Graefe).

Claim 7:

Regarding claim 7, the combination of Graefe in view of Agarwal teaches wherein the index organized table includes non-key information used for determining locations of gaps in ranges of dimension value combinations that are between the segments (column 9, lines 44-49, wherein this reads over "a bit map covering the pages of the block indicating which pages are empty, e.g., 0 – empty, 1= empty, Agarwal).

Claim 8:

Regarding claim 8, Agarwal teaches wherein at least one of the plurality of segments includes more than one contiguous range of dimension value combinations (Refer to claim 3, wherein this limitation is substantially the same/or similar and therefore rejected under the same grounds, Agarwal).

Claim 9:

Regarding claim 9, the combination of Graefe in view of Agarwal teaches wherein at least one of the plurality of segments comprises at least two contiguous range of dimension value combinations that are joined together by at least one dummy entry in the table, therein forming one contiguous range of dimension value combinations (column 11, lines 5-45, wherein this reads over "a new block would be allocated for table and used to insert the row as cited in lines 38-40, wherein this is interpreted to be equivalent to "at least one dummy entry in the table, therein forming one contiguous range of dimension value combinations", Agarwal).

Claim 10:

Regarding claim 10, the combination of Graefe in view of Agarwal teaches wherein the at least two of the plurality of segments are each divided into blocks having a block size, and the block size of a first of the at least two of the plurality of segments is different from the block size of a second of the at least two of the plurality of segments (column 5, lines 63-67, wherein this reads over "the grid represents the logical partitioning of the these blocks and each square, such as

square 302, wherein the square corresponds to "plurality of segments", which represents a logical cell, wherein a column or row in the grid represents a slice for a particular dimension, wherein this is interpreted to be "wherein the at least two plurality of segments are each divided into blocks having a block size", Agarwal).

Claim 11:

Regarding claim 11, the combination of Graefe in view of Agarwal teaches wherein the **indexed organized table** includes an identification of a reference location for each segment of the plurality of segments from which offsets from the reference location are calculated to reach other locations in each of the segments (column 9, lines 9-51, wherein this reads over "each block may have a header, located in the fist slot of the block's first page which stores a structure, and wherein each block may also have a free space control record associated with it that could contain page offsets and approximations of free space per page, wherein this is interpreted to be equivalent to "**indexed organized table** includes an identification of a reference location for each segment of the plurality of segments from which offsets from the reference location are calculated to reach other locations in each of the segments", Agarwal).

Claim 12:

Regarding claim 12, the combination of Graefe in view of Agarwal teaches wherein each of the plurality of segments is divided into one or more blocks of equal size (Refer to claim 10, wherein this limitation is substantially the same/or similar

and therefore rejected under the same grounds).

Claim 13:

Regarding clam 13, the combination of Graefe in view of Agarwal teaches wherein the accessing of the location of interest is also performed by at least accessing a table having an identification of a dimension value of a reference location included in the block from which offsets are calculated to other locations (column 8, lines 5-19, wherein this reads over "the first two columns in the pivot specification must be columns in the pivot operation's input table, wherein these columns will not appear in the pivot operation's output table, and each value in the pivot list within the pivot specification defines a new column in the pivot operation's output table and in the input table, elements in the pivot list appear as values in the pivot column, corresponding values in the value column become values in the new columns in the output table, Graefe).

Claim 14:

Regarding claim 14, Agarwal teaches wherein the reference location is an index value of a first of location within a segment that stores rows for a contiguous range of dimension value combinations (Refer to claim 3, wherein this limitation is substantially the same/or similar and therefore rejected under the same grounds, Agarwal).

Claim 15:

Regarding claim 15, the combination of Graefe in view of Agarwal teaches wherein the table having the identification is a B-tree index (column 5, lines 18-51, respectively, Agarwal).

Claim 16:

Regarding claim 16, the combination of Graefe in view of Agarwal teaches wherein the table having the identification is a bit map index (column 2, lines 30-33 and lines 40-45, respectively, Agarwal).

Claim 17-32:

Regarding claims 17-32, the combination of Graefe in view of Agarwal teaches a computer-readable medium carrying one or more sequences of instructions, which when executed by one or more processors, causes the one or more processors to perform (column 4, lines 35-42, respectively, Agarwal).

Claim 34:

Regarding claim 34, Graefe computer-readable medium **that is readable by a database system,** having stored therein at least:

a database table **containing** data **items** on the computer readable media that corresponds to locations associated with at least one dimension value (column 5, lines 61-63, wherein the nested subquery SELECT AVG sales FROM Narrow and generates a table having only a single row containing the average value of sales in the Narrow table, Graefe);

a database system defines, for said database table, a dimension column that contains dimension values (Figures 1 and 2, wherein these figures are further defined in columns 4-5 and Figure 4, all features, wherein it illustrates database table, dimension column that contains dimension values, Graefe); and

wherein said database system defines a dimension column for said database table that contains dimension values (Figure 4, all features, wherein it illustrates a dimension column for said database table that contain dimension values, Graefe);

Graefe does not explicitly specify or define "units of contiguous storage", however, Graefe does teach the functionality of an "contiguous storage" (column 6, lines 12-13, wherein sequencing accesses to the records of stored database tables".

On the other hand, Agarwal does explicitly define and specify that "wherein the data items are stored in **units of contiguous storage** in an order dictated by the dimension values to which the data items correspond (column 7, lines 50-63, wherein the three dimensional is dimensioned along the year and month dimension the providence dimension, and the color dimension, wherein the aggregate sales of the color=red over all dates and regions could be processed and the processing this query includes .....", Agarwal); and

It would have been obvious to one of the ordinary skill in the art at the time of the invention to incorporate Agarwal teachings into Graeme system. A skilled artisan would have been motivated to combine as suggest by Agarwal [column 7, lines 61-63 and column 8, lines 51-58] for establishing an improved method of

accessing data more efficiently and effectively by narrowing down a search based on a specific attribute to improve the performance of a system.

wherein the database table does not store values for the particular dimension column (column 8, lines 61-63, wherein a row in the input table does not appear in the output if its value does not appear in the pivot list and column 9, lines 1-2, wherein for output columns not having a corresponding input row, the value is NULL, Graefe).

Claim 35:

Regarding claim 35, the combination of Graefe in view of Agarwal teaches computer-readable medium teaches wherein all of the locations of the database table that are associated with non-null values dimension are organized into one or more segments, each segment including a contiguous region of data without discontinuities in the dimension values (Figures 7a, 7b, and 7c, all features further defined in column 8, lines 16-40, respectively, Agarwal).

Claim 36:

Regarding claim 36, the combination of Graefe in view of Agarwal teaches computer-readable medium teaches wherein the table has associated with it at least one dimension value combination:

that is associated with a null value, and that is not included in any of the one or more segments (column 9, lines 39-41, wherein this reads over "a null value in a

pivoted column does not generate an output row", Graefe).

Claim 37:

Regarding claim 37, the combination of Graefe in view of Agarwal teaches wherein the computer-readable medium system also has stored therein at least:

another table storing identifiers for determining the locations stored within each segment of the one or more segments (Figure 4, diagram 430, all features which corresponds to diagram 410 or vice versa, Graefe).

Prior Art of Record

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Witkowski et al	(US Patent No. 6,457,000)
Agarwal et al	(US Patent No. 7,080,081)
Graefe et al	(US Patent No. 6,298,342)

Point of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helene Rose whose telephone number is (571) 272-0749. The examiner can normally be reached on 8:00am - 4:30pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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